

KARST HYDROGEOLOGY OF THE HAGERSTOWN VALLEY, MARYLAND

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ABSTRACT

The Hagerstown Valley of Washington County, Maryland, is underlain by predominantly carbonate, lower Paleozoic rocks which are folded and faulted and in which a karst landscape has developed. These rocks are shown on a new compilation of recent mapping in the Valley.

About 89 percent of the Hagerstown Valley is underlain by carbonate rocks. These rocks are characterized by tertiary porosity and permeability, that is, ground water moves through fractures and bedding-plane separations that have been enlarged by dissolution of rock by circulating ground water. The remaining rocks (shale, sandstone, and some diabase) are fractured to varying degrees but not susceptible to dissolution.

- 8 More than 50 known caves and about 200 wells intersecting cavernous zones attest to the development of caverns in the carbonate rocks of Hagerstown Valley.
- 8 Naturally-occurring dolines (sinkholes) with gently-sloping sides may be found in at least half of the two dozen mapped bedrock units; more than one quarter of them formed over the Chambersburg Limestone, which makes up only about 1 percent of the bedrock area.
- 8 More than 190 springs in the Hagerstown Valley are point-discharge sites for ground water; only 4 of these discharge from the Chambersburg Limestone.
- 8 Much ground water discharges diffusely to streams.

Geologic structure is the dominant control on ground-water flow of the Hagerstown Valley:

- 8 Bedding-plane separations and strike-parallel joints direct ground-water, under the driving force of the hydraulic gradient, to flow parallel to the strike of bedding (generally toward the north-northeast or toward the south-southwest).
- 8 Joints and cross faults direct ground-water flow at some locations.

Various hydrogeologic and karst aspects were mapped and the georeferenced data were entered into a Geographic Information System (ARC/INFO) to allow this information to be integrated with other geographic information as needs arise.